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P R O C E E D I N G S
OF THE
AMERICAN PHILOSOPHICAL SOCIETY.

VOL. IV.	MAY—AUGUST, 1845.	No. 33.
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Stated Meeting, May 2.

Present, twenty-seven members.

Prof. A. D. BACHE, Vice-President, in the Chair.

Mr. Edward Miller, a member elect, was presented, and took his seat.

Letters were announced and read:—

From the Museum d'Histoire Naturelle, dated Paris, 15th March, 1845, announcing the receipt of the Transactions and Proceedings of this Society: and,—

From the Bowditch Library, dated Boston, February, 1845, acknowledging the receipt of a donation from this Society.

The following donations were announced:—

FOR THE LIBRARY.

Transactions of the Society for the Encouragement of Arts, Manufactures, and Commerce. Vol. LV. London, 1845. 8vo.—
From the Society.

Third Bulletin of the Proceedings of the National Institute for the Promotion of Science, Washington, D. C. February, 1842, to February, 1845. Also, Proceedings of the Meeting of April, 1844. Washington, 1845. 8vo.—*From the Institute.*

Report of the Aboriginal Names and Geographical Terminology of the State of New York. Part I. Valley of the Hudson. Made to the New York Historical Society, by Henry R. Schoolcraft. New York, 1845. 8vo.—*From the New York Historical Society.*

The African Repository and Colonial Journal. Vol. XXI. April, 1845. No. 4. 8vo.—*From the American Colonization Society.*

Twenty-seventh and Twenty-eighth Annual Reports of the Superintending Committee of the London Provident Institution, 1843, 1844.—*From Wm. Vaughan, Esq.*

Letter to the Secretary of the Treasury, communicating a Report of Chemical Analyses of Sugars, Molasses, &c.; and of Researches on Hydrometers, made under the Superintendence of Prof. A. D. Bache. By Prof. R. S. McCulloh.—*From the Author.*

Catalogue of Plants, collected by the Botanical Department of the Providence Franklin Society, principally in Rhode Island, in 1844. Arranged by S. T. Olney. 8vo.

Directions in regard to the Operations of the Coast Survey, for 1845-46. Approved by the Treasury Department, March, 1845.—*From Professor A. D. Bache.*

Letter to the Secretary of the Treasury, communicating a Report of the Superintendent of the Construction of Standard Weights and Measures.—*From the same.*

The Medical News and Library. Vol. III. May, 1845. 8vo.—*From Messrs. Lea & Blanchard.*

Extrait du Catalogue Général de Hector Bossange. Paris, 1845. 8vo.—*From Clement C. Biddle, Esq.*

ADDITIONS TO THE LIBRARY BY PURCHASE.

The London, Edinburgh, and Dublin Philosophical Magazine, and Journal of Science. Third Series. Nos. 154 to 171, inclusive. December, 1843, to February, 1845. 8vo.

The Edinburgh New Philosophical Journal. Conducted by Professor Jameson. Nos. 71 to 75, inclusive. January, April, July, October, 1844. January, 1845. 8vo.

Astronomische Nachrichten. Nos. 529, 530. 4to.

On motion of Dr. Dunglison, Mr. Fraley was appointed to prepare an obituary notice of Mr. Wm. H. Keating.

Mr. Lea read a continuation of his paper on Fresh Water and Land Shells, which was referred to a Committee, consisting of Dr. Griffith, Dr. Hays, and Mr. Ord. The paper contains descriptions of twenty-six new species of the genera *Unio*, *Margaritana* and *Anodonta*; twenty-three of *Me-*

lania; two *Anculosa*; six of his new genus *Schizostoma*; and one *Paludina*; the whole being from the Southern States.

Dr. Franklin Bache having temporarily taken the chair,—

Prof. A. D. Bache called attention to the report made by him in February last, to the Treasury Department, on the progress of the construction of standard weights and measures, and of balances. A copy of this report had been presented to the Society at a previous meeting.

The work of constructing standards had been commenced by the late Mr. F. R. Hassler in 1835; and at the time of his decease the standard weights for the Custom Houses of the United States and for the States had been made, and generally delivered. One-third of the capacity measures had been completed, and the rest were in different stages of progress. About one-fourth of the measures of length had been finished, and the rest were in progress. Many other standards for miscellaneous purposes had been made and delivered. The balances used in the office of weights and measures to adjust standards had been made; two other balances had been finished, and thirty, intended for distribution to the States, had been commenced.

The standard weights sent to the Custom Houses and States, consisted of 1 lb. troy; 1, 2, 3, 4, 5, 10, 20, 25, and 50 lbs. avoirdupois; besides which, sets of weights from 10 oz. to $\frac{1}{1600}$ oz. troy had been distributed to the States.

The standard measure is a yard, subdivided.

The liquid capacity measures sent to the principal Custom Houses and to the States, consisted of a gallon, half gallon, quart, pint, and half pint.

The standard of dry measure was the half bushel, one of which had been prepared for each of the States.

The set of balances consisted of three; one for weights from 1 lb. to 150 lbs., one for medium weights, and one for small weights.

The plan of construction of the balances had been modified by Mr. Joseph Saxton, who had been appointed assistant in the office of weights and measures in January, 1845. The work on the balances had been advanced, during the past year, about one-seventh towards completion, being now about two-fifths done.

Much progress having been made in the preparation and distribution of standard measures when Professor Bache came into the charge of the work, he had deemed it necessary to adhere to the methods of

Mr. Hassler, and to use the tables founded upon his experiments, for reductions; otherwise the uniformity of the system would have been destroyed. During the past year, thirty-four gallon measures had been adjusted and compared, completing the part of the work relating to liquid capacity measures. A set of capacity measures had been adjusted and compared for the Ordnance Department; repeated comparisons had been made of the bars used in measuring the base lines of the coast survey. The results would be found in detail in the report.

Professor Bache then referred to the necessity for action by the different States to distribute standards to the counties, and thus to introduce uniformity in the weights and measures in actual use.

Professor Bache referred in this connexion to the successful effort of Mr. Saxton to render automatic the Troughton dividing engine imported by the late Mr. Hassler, for the workshop of the Coast Survey. The performance of this engine had never been satisfactory. Its use was fatiguing to the operator, and as he governed the action of the machine, irregularities must result. The length of time required to divide a circle, permitted great fluctuations of temperature, and the heat from the body of the workman acted continually as a disturbing cause. The division being made by a tool governed by hand, the cutting was necessarily imperfect. By a simple and effective mechanism, the engine had been rendered entirely automatic, a wheel turned by a handle giving motion to all the parts. Thus the screw, giving motion to the dividing wheel, was made to play regularly; and as the wheel moved, the cutting tool was raised, and, descending, traced lines of the requisite length for the subdivisions of five or ten minutes, quarter and half degrees, degrees, and ten degrees; and when the circle was completed, was thrown out of gear. The time of dividing a circle was reduced from more than two days, to less than two hours.

It had been found that the moveable centre of the machine was imperfect; and this defect remedied, it appeared that the cutting of the teeth upon the dividing wheel was not perfectly uniform. These smaller irregularities were in the course of correction. Each attempt to divide a circle upon the engine had been an improvement upon the preceding one.

Prof. A. D. Bache having resumed the chair,—

Mr. Walker communicated some observations upon the comet discovered by Captain Hiern in the Gulf of Mexico,

upon 11th January. Prof. Kendall and himself commenced observing it upon the night of 26th January, and continued until the middle of March. They had made about eight hundred micrometrical measurements, and the place of the comet had been compared with about one hundred fixed stars. The elements calculated by Prof. Encke agreed very closely with those Prof. K. obtained from these observations. Prof. Encke suggests that this may be the comet announced to appear in 1848. Messrs. W. and K. had also observed Mauvais' second comet on the 18th of January, and on several subsequent evenings, both with the equatorial and the meridian instruments.

Stated Meeting, May 16.

Present, twenty-two members.

Dr. FRANKLIN BACHE, Vice-President, in the Chair.

Letters were announced and read:—

From Pierre de Angelis, dated Buenos Ayres, 18th February, 1845, relating to an error in the title of a pamphlet by him: and,—

From Antonio Ladislau Monteiro Baena, announcing a donation by him to the Society.

The following donations were announced:—

FOR THE LIBRARY.

Summary of the Transactions of the College of Physicians of Philadelphia. From November and December, 1844, to March, 1845. Vol. I. No. 9. 8vo.—*From the College.*

Biographical Memoirs of John C. Otto, M.D., late Vice-President of the College of Physicians; read before the College by appointment, March 4, 1845. By Isaac Parrish, M.D. Philadelphia, 1845. 8vo.—*From the same.*

Fifty-eighth Annual Report of the Regents of the University of the State of New York. Read to the Legislature, March 1, 1845. Albany, 1845. 8vo.—*From the Regents.*